

Claims

1-25 (Canceled).

26. A distinct color LCD apparatus including

at least one layer of encapsulated cholesteric liquid crystal material;

electrically conductive means for addressing a plurality of parallel addresses across the encapsulated cholesteric liquid crystal material in the at least one layer; and

an electrical pulse driving means connected to said electrically conductive means and arranged to supply drive signals to the plurality of parallel addresses to drive the cholesteric liquid crystal material selectively into a homeotropic state or a planar state, the electrical pulse driving means being arranged to supply drive signals which provide a predetermined grey level by driving the cholesteric liquid crystal material into homeotropic state in a fraction of a predetermined time period and into the planar state in the remainder of said time period.

27. The distinct color LCD apparatus according to claim 26 further including a pair of glass plates on opposite sides of the at least one layer of encapsulated cholesteric liquid crystal material.

28. The distinct color LCD apparatus according to claim 26 further including a front plate made of glass.

29. The distinct color LCD apparatus according to claim 26 further including a back plate made of glass.

30. The distinct color LCD apparatus according to claim 26 further including a back plate made of a nonvolatile inert solid material.

31. The distinct color LCD apparatus according to claim 30 wherein the back plate is one selected from the group consisting of being colored black, being transparent and being reflective.

32. The distinct color LCD apparatus according to claim 30 wherein the back plate is colored with a predetermined spectral bias selected to enhance color characteristics of the most proximate encapsulated cholesteric liquid crystal material in the at least one layer.

33. The distinct color LCD apparatus according to claim 26 further including at least one "color" layer selected from the list:

- A. a black near ultra violet layer;
- B. a black near infra red layer;
- C. a black visible spectrum absorptive layer.

34. The distinct color LCD apparatus according to claim 26 wherein the electrically conductive means are arranged to generate an electric field oriented substantially perpendicular across the at least one layer of encapsulated cholesteric liquid crystal material .

35. The distinct color LCD apparatus according to claim 26 wherein the electrically conductive means include ITO on facing surfaces of the at least one layer.

36. The distinct color LCD apparatus according to claim 26 wherein the electrically conductive means include vapor deposited conductors on facing surfaces of the at least one layer.

37. The distinct color LCD apparatus according to claim 26 wherein the electrical pulse driving means is arranged to supply drive signals which provide a predetermined grey level by the drive signals being formed, in a number of predetermined portions into which said time period is divided, to drive the cholesteric liquid crystal material into the homeotropic state in a number of the portions and into the planar state in the remainder to the portions.

38. The distinct color LCD apparatus according to claim 26 wherein the electrical pulse driving means is arranged to generate a waveform selected from the list: Alternating Current (AC), Balanced Direct Current (bDC), Time Balanced Modulated Charges (tbMC), combinations of the aforesaid, and any of the aforesaid within a predetermined decay envelope.

39. The distinct color LCD apparatus according to claim 26 wherein the electrical pulse driving means includes a controller for optimizing refresh time across an ensemble of the substantially parallel addresses.

40. The distinct color LCD apparatus according to claim 26, including at least two said layers of encapsulated liquid crystal material maintained proximate to each other and in a substantially parallel orientation.

41. The distinct color LCD apparatus according to claim 40, further including structural means for maintaining the at least two said layers proximate to each other and in a substantially parallel orientation.

42. The distinct color LCD apparatus according to claim 40, further including an interstitial membrane between a pair of the at least two layers.

43. The distinct color LCD apparatus according to claim 40, wherein the cholesteric liquid crystal material of each one of the at least two layers reflects light of a respective color in the planar state.

44. The distinct color LCD apparatus according to claim 42, wherein said colors of the at least two layers include a combination selected from the list:

- A. a red layer and a green layer and a blue layer;
- B. a cyan layer and a magenta layer and a yellow layer;
- C. a red layer and a green layer;
- D. an orange layer and a blue layer;
- E. a yellow layer and a magenta layer.

45. The distinct color LCD apparatus according to claim 26, wherein the electrically conductive means provides direct drive of each of said plurality of substantially parallel addresses.